

What is claimed is:

- [Claim 1]** 1. A process for discharging dry bulk materials from a bulk container that ensures first-in, first-out uninterrupted flow comprising the steps of
- providing a substantially conical container bottom,
 - providing a plurality of air-permeable zones disposed along the container bottom, said zones comprising at least five substantially pie slice shaped zones and one donut shaped zone surrounding a container outlet, and
 - providing air alternately to the donut shaped zone and at least one of the pie shaped zones.
- [Claim 2]** 2. The process of claim 1, further comprising the step of providing a wall liner.
- [Claim 3]** 3. The process of claim 1 wherein each pie shaped zone has a surface area less than thirty square feet.
- [Claim 4]** 4. The process of claim 1 wherein the surface area of each zone is less than 20% that of the surface of the container bottom.
- [Claim 5]** 5. The process of claim 1 wherein ten or eleven pie shaped zones are provided.
- [Claim 6]** 6. The process of claim 1 wherein the container bottom forms an angle about 15 degrees with horizontal.
- [Claim 7]** 7. The process of claim 1 wherein the air is provided to the donut shaped zone for intervals of about six seconds.

[Claim 8] 8. The process of claim 1 wherein the air is provided to at least one of the pie shaped zones for intervals of about 20 seconds.

[Claim 9] 9. The process of claim 1 wherein the air is alternately provided to the zones sufficient to cause at least 100 lbs/minute to flow out of the container outlet.

[Claim 10] 10. The process of claim 1 wherein the air is provided at about 1 psi gauge.

[Claim 11] 11. An apparatus for discharging dry bulk materials from a bulk container that ensures first-in, first-out uninterrupted flow comprising
a substantially conical container bottom,
at least five pie shaped air permeable zones disposed about the container bottom, and
one donut shaped air permeable zone surrounding a container outlet.

[Claim 12] 12. The apparatus of claim 11 wherein the air permeable zones are made of webbed fabric.

[Claim 13] 13. The apparatus of claim 12 wherein the air permeable zones are formed by a webbed fabric secured in a spaced, substantially air tight, arrangement to the container bottom.

[Claim 14] 14. The apparatus of claim 11 wherein the air permeable zones are made of a two-ply fabric disposed at the container bottom, the ply nearest the bottom made of a substantially air tight material.

[Claim 15] 15. The apparatus of claim 14 wherein the first ply is PVC.

[Claim 16] 16. The apparatus of claim 14 wherein the second ply is made of a webbed material.

[Claim 17] 17. The apparatus of claim 14 wherein the zones are made by sewing the plies together radially to make the pie slice shaped zone and circumferentially to make the donut shaped zone.

[Claim 18] 18. The apparatus of claim 11 wherein the zones are formed by laying down strips of material over an air permeable fabric and securing the strips to the container bottom radially for pie slice shaped zones and circumferentially for the donut shaped zones.

[Claim 19] 19. The apparatus of claim 11 wherein each zone has a surface area of between 15 and 20 square feet.

[Claim 20] 20. The apparatus of claim 11 further comprising a flexible sidewall liner.

[Claim 21] 21. The apparatus of claim 20 wherein the liner is in communication with the outside perimeter of the pie slice shaped zones.

[Claim 22] 22. The apparatus of claim 21 wherein the liner is sewn to the perimeter of the zones.

[Claim 23] 23. The apparatus of claim 11 wherein the container bottom forms a less than 60 degree angle from horizontal.

[Claim 24] 24. The apparatus of claim 11 wherein the container bottom forms an angle of approximately 15 degrees from horizontal.

[Claim 25] 25. The apparatus of claim 11 further comprising an air blower in communication with the air permeable zones.

[Claim 26] 26. The apparatus of claim 25 further comprising an air distribution controller adapted to alternately provide air to the donut shaped zone and at least one of the pie shaped zones.

[Claim 27] 27. The apparatus of claim 25 further comprising an air diffuser for each zone in communication with the blow and air permeable zones adapted to diffuse the direction of the air entering the zones.

[Claim 28] 28. The apparatus of claim 11 wherein the surface area of each pie slice shaped zone is less than 30 square feet.

[Claim 29] 29. The apparatus of claim 11 wherein the surface area of each zone is less than 20% that of the surface area of the container bottom.

[Claim 30] 30. The apparatus of claim 11 wherein ten or eleven pie slice shaped zones are provided.

[Claim 31] 31. The apparatus of claim 11 wherein the bulk container is a silo.

[Claim 32] 32. The apparatus of claim 21 further comprising a liner top with at least one pleated air filter.

[Claim 33] 33. A process for filling a bulk container with a bulk material to maximize the contents comprising

- providing a substantially conical container bottom,

- providing a plurality of air permeable zones disposed along the container bottom, said zones comprising at least five substantially pie slice shaped zones and one donut shaped zone surrounding a container outlet,

- filling the container with the material from an inlet, and

- providing air alternately to the donut shaped zone and at least one of the pie slice shaped zones, such that the material settles into the container with a substantially flat surface level.